PERCEPTIONS OF FUTURE DEVELOPERS INTO GREEN HOME PROJECT IN KUALA LUMPUR

YASER ABDULWAHAB ALI ALSAEEDI

A thesis submitted in
fulfilment of the requirement for the award of the
Degree of Master of Science in Construction Technology Management

Faculty of Technology Management and Business
Universiti Tun Hussein Onn Malaysia

JANUARY 2019

DEDICATION

First, I would like to announce my appreciation to Allah Almighty for this grace, guidance and protection of me during Master study. I dedicate this dissertation with countless appreciation to my beloved father & mother who had supporting me throughout my study life and to my beloved family members (brothers & sisters).

ACKNOWLEDGEMENT

First and foremost, I would like to express my millions of gratitude and appreciation to Dr. Sulzakimin Bin Mohamed as my supervisor for my Master project. With his assistance and guidance, the research is able to be accomplished and completed successfully. I really appreciate the advices and encouragement that given by Dr Sulzakimin. He helps me lots in making the research a success. Thanks to the lectures and staff in the Department of Construction Management in UTHM who were involved directly or indirectly in the project.

I would like to acknowledge to my dearest parents Mr Abdulwahab Ali Alsaeedi and Mrs Fatimah Saleh Aldrsi for all the spiritual support and uncountable love. Not forgetting, thousands of thanks to my uncle, Talal Ali Alsaeedi for encouraging and helping me throughout my study life.

I am extremely grateful to the respondents in my research. The research would not possible to be completed without the cooperation and information provided from them. Thank you for providing and sharing of valuable information as guidance and essential resources that needed in the research.

Without all of the assistant and support, the accomplishment and completion of research will not be possible.

ABSTRACT

Green home is rapidly becoming a strong momentum in the construction industry after recognizing many negative environmental issues & problems and potential social and economical benefits around the world. However, developers still using conventional way to construct the housing. This gives huge impact to the environment and also human health. Meanwhile, there are actually some barriers hinder developers to adopt this in their projects. This study examines the perceptions of the developers in Kuala Lumpur on the future of the green housing sector for the next 20 years, their commitment about green housing and propose solution for improvement green home project in Kuala Lumpur. The methodology used in this study is questionnaire and it is targeted 200 developer's firms in Kuala Lumpur.The introduction of Green home rating system, improvement of awareness and knowledge among the stakeholders, support from the government and local industry and the effect of competitive advantage would support brighter future. Meanwhile, the status quo in rules and regulation, lack of public interest and demand, organization disinterest, local authority enforcement and project cost escalation would hinder a faster progress. Finally, this study could really help the awareness on environment and in improve the green home project among developers.

ABSTRAK

Rumah hijau dengan pesat menjadi momentum yang kuat dalam industri pembinaan selepas mengenal pasti banyak isu dan masalah alam sekitar yang negatif dan potensi manfaat sosial dan ekonomi di seluruh dunia. Walau bagaimanapun, pemaju masih menggunakan cara konvensional untuk membina perumahan. Ini memberikan impak besar kepada persekitaran kita dan juga kesihatan manusia. Sementara itu, ada sesetengah halangan yang menghalang pemaju untuk mengadopsi ini dalam projek mereka. Kajian ini mengkaji persepsi para pemaju di Kuala Lumpur pada masa depan sektor perumahan hijau untuk 20 tahun akan datang, komitmen mereka mengenai perumahan hijau dan mencadangkan penyelesaian untuk projek rumah hijau pembaikan di Kuala Lumpur. Metodologi yang digunakan dalam kajian ini adalah soal selidik dan disasarkan kepada 200 firma pemaju di Kuala Lumpur. Pengenalan sistem penarafan rumah Hijau, peningkatan kesedaran dan pengetahuan di kalangan pihak berkepentingan, sokongan daripada kerajaan dan industri tempatan dan kesan kelebihan daya saing akan menyokong masa depan yang cerah. Sementara itu, status quo dalam peraturan dan peraturan, kekurangan kepentingan dan permintaan awam, ketidakpuasan organisasi, penguatkuasaan pihak berkuasa tempatan dan peningkatan kos projek akan menghalang kemajuan yang lebih pantas. Akhirnya, kajian ini dapat membantu kesedaran tentang alam sekitar dan memperbaiki projek rumah hijau di kalangan pemaju.

.

Table of Contents

List of Tables

List of Figures

CHAPTER 1

1.1 INTRODCTION

The concept of sustainability and green home projects are crucial for developing countries. In some country, neither green housing design nor sustainability philosophy seems to become a major determinant for architectural design process. Yet, the country shares the same problems with the others in the world. Green design is not a choice, but a requirement in the world since the sustainability paradigm emerged in the last quarter of the 20th century. It offers not only a healthy ecosystem, but also many advantages for both the dweller and the country in terms of environmental, economic, social, cultural and health issues (SEZER, 2009).

Moreover, buildings, environment and the infrastructure are one part of our living environment and thus will impact our living conditions, health and social welfare. Therefore, it is very important to explore technologies for designing and developing environmental and economically reasonable infrastructure and infrastructure that can make them green, sustainable, healthy and affordable and promote construction innovation. The concept of sustainable development was first suggested by Brundtland the Commission described it in 1972 as "meeting current needs without compromising the ability of future generations to meet their own needs." However, this definition has evolved since then (Shafii, 2006).

In additional, the sustainable development of the built environment has been gained popular momentum for over 25 years, enabling all people to meet their basic needs and improve their quality of life while saving our natural resources and diversity. in the construction building, the Buildings account for 41% of total U.S. energy consumption, 73% of the electricity consumption and 39% of the US's carbon dioxide emissions.

Therefore, stakeholders in the construction industry have been adopted the concept of sustainability in all construction activities. In order to achieve the sustainable development goals of the building sector, green design and construction principles offer away for the construction industry to introduce numerous benefits, including better energy efficiency, increased health and occupant productivity, improved indoor environmental quality and the minimization of resource usage, into the construction process and throughout the lifetime of the building (Ahna, 2016).

1.2 Background

The one of the major drivers in any country's development is housing industry. The contribution of housing industry are the economic and social development but lacking in terms of environmental protection. In contrast, green housing should reflect the sustainability delivery and contribute to ecological protection and resource- efficient (Mohamed, 2015). In last twenty years, Malaysia has been reliably contributing among 3% to 5% of national gross domestic (GDP) in construction industry. However, industry of construction is likewise an industry that to give a share in negative effects to environment, for example, sedimentation, soil erosion, depletion of natural resources, flash flood and utilize of industry is that because the achieve of vision 2020, where it calls for adequate housing and rapid urbanization. in light of this, most of developers have prioritized economic problems instead of environmental issues and ecological (Yoong, 2014).

Green home is defined a space and vitality productive home which can offer comfort and health environment living to its inhabitants. Green home works by utilizing sustainable resource. it is considered as sustainable resource in the sense that it can maximize our resources by taking its resources from the natural environment and produce less effect on the environment. The concept of green home can fill up the life of homeowner with style and lavishness and it is considered as another positive advantage to the community (yudelson, 2007). There are two sorts of green home which are healthy

green homes and affordable green homes. Healthy green home accentuations on controlling a home's resources which can contaminate the environment for the homeowner and builder. Moreover, affordable green home, the energy-saving features should be able to estimate cost efficiently. Therefore, green home can be considered as a lifetime home (Alias, 2010).

In these days, all the population around the world is getting increasingly worried about the human activities or natural which can lead to global warming and also can cause issue pollution to environment. Earth is overmuch being open to all sorts of contamination resource. Each individual need to play their roles in protecting the Earth. Innovation of green technologies can be utilized to change our environment and protect the earth from pollution. The United Nations Environment Program (UNEP) stated that environmental issue of water shortages and global warming are the major problems that the world face it(Alias, 2010). UNEP announced that these environmental problems will jeopardize the people other than imperil the Earth. green technologies can be utilized to save the Earth and also to change environment around us. home owners utilized up big amounts of energy which become a main source of global warming since it generated among 10 and 30 tons of carbon dioxides annually. Some 1.8 billion tons or more carbon dioxides could be protected by applying green development.

In additional, green buildings impact the environment less during construction, provide healthier place for their occupants and are more cost-efficient over the life cycle than conventional structures. However, there are two type of benefit sustainable housing which are direct benefit such as reduce energy consumption economies in operational cost and fuel bills either for owner or tenant, market advantage and lower long term exposure to environmental or health problems and greater productivity of work force and the second type of benefit is indirect benefit such as healthier to use, psychological advantage , enhances company image and global benefits (Isa, 2014).

Therefore, the green development and sustainable development play a huge role to decrease the pollution of Earth. the concept of green home is one of efforts which made to decrease the effect builders and homeowners caused to the environment (Zainul Abidin, 2012).

1.3 Problem statement

It is a fact that the natural resources are limited for the mankind with the way of present use. Reduction of environment load of building, especially energy consumption, Water consumption and the consumption of raw materials are a possible an important element how to solve the problem.

Moreover, according to previous research by (Klufallah, 2014) the result of the study presented that the carbon emissions equivalent per one square meter of conventional housing and green housing were 733.7 kg co2/m^2 and 698.01 kg co2/m^2 respectively. in additional, the emission of carbon in green housing was less than conventional housing by 4.8%. from this phrase, it presented that the sustainable housing can decrease the carbon emitted which that means prevent harm the environmental with good rate. Therefore, Construction practitioners should always aware of these related issues especially in developing green homes. Moreover, as mentioned by (Ibrahim, 2014), that the construction industry needs more efforts so the housing developer firm's readiness in green houses development can be boosted. Therefore, this is one of the barriers which prevent the green home project develop in Malaysia. The awareness on constructing sustainable housing is still very low among the construction practitioners and also there are many of barriers which prevent the green home projects and green home projects develop in Malaysia such non-enough awareness about green home project among construction practitioners , no enough support from government and green product supply support. moreover, as confirmed by (Ali, 2006), Malaysia is having issues for such as waste material, deforestation, energy waste and other related problems. therefore, it is very important to improve green homes in order to generate a greener environment and housing.

As mentioned, previous that construction industry in Malaysia plays an important role in economy growth and the GDP of construction industry contribute around 3% to 5% in last 20 years (Yoong, 2014). in tenth Malaysia plan (2010), the government did

attention on the sustainable development in Malaysia and one part of plan was focused about sustainable housing and tax incentives for buildings and designs that are environmental friendly (Mohamed, 2015). Therefore, the incentives which was provided by government are not really attract the developers (Elias, 2013). So, at this moment, green movement still at a slow pace, but for the coming years, develpers may change their direction to green development (Mohamed, 2015).

As declared by (Zainul Abidin, 2012) , that the companies who have large capital, they have the ability to adopt sustainable practices, whereas the companies who have small capital would minimum the costs on this. however, in Malaysia is not compulsory the concept of sustainable to be adopted as many of the buyers do not demand for it. in additional, the developers are hesitant to focus something new, while their business attractiveness is going in best condition (Zainul Abidin, 2012). even the developers are more interested to get green certification but this will add more cost on the projects. As listed above are the obstacles for constructing the sustainable building. Thus, in this study, the commitment of the developers is studied if they are willing to build green home projects even there are some obstacles in the reality. Moreover, this able to provide more useful information for the construction practitioners to take the initiative step for constructing green homes in the future (Mohamed, 2015).

1.4 Research question

I. What are the perceptions of developers with regard to the green home projects in the next 20 years?
II. What is the developers' commitment on green home projects?
III. What is the solution that can improvegreen home projects in Kuala Lumpur Malaysia?

1.5 Objective

The following are the objectives for this research: -

- To study the perceptions of developers with regard to the green home projects in the next 20 years.
- To investigate developers' commitment on green home projects.
- To propose a solution to improve the green home projects in Kuala Lumpur Malaysia.

1.6 Significance of the study

This research is to study developers' perception with regard to green housing which give a clear idea to the other construction practitioners to be able to prepare for coming years and change their interest from conventional practice project to green practice project. Besides that, by building green houses can bring many of benefits to construction industry. however, green houses are friendly to environment since the power source is from renewable energy. thus, from this research, it is able to show the commitment of the developers on green home projects. and also, from the commitment level of the developers can help the related parties take a concern on the problems. in addition, it is carried out any improvements in future. lastly, this study can be used in any academic study or make it as a reference in a study for green home.

1.7 Scope of the study

This study is mainly focus on developer firms in Kuala Lumpur area which are a member under Real Estate and Housing Developers' Association Malaysia (REHDA). From the REHDA members listing (2013), it showed that there is a total of 200 firms in Kuala Lumpur.

This study of research is limited to the developer firms in Kuala Lumpur. The questionnaire survey was adopted. The respondents involved in data collection are limited to the construction practitioners under developer's firms aware of content, who have more than 20 years of experience in the construction industry. Besides that, the participants involved in this study are project manager, developers, architects, project engineer. Furthermore, this study will identify the expert opinion for perceptions of developers with regard to the green home projects in the next 20 years in Kuala Lumpur construction projects. Since. The place chosen is Kuala Lumpur to investigate as a one of big Malaysian city which is currently undergoing developing city in infrastructure.

1.8 Research process

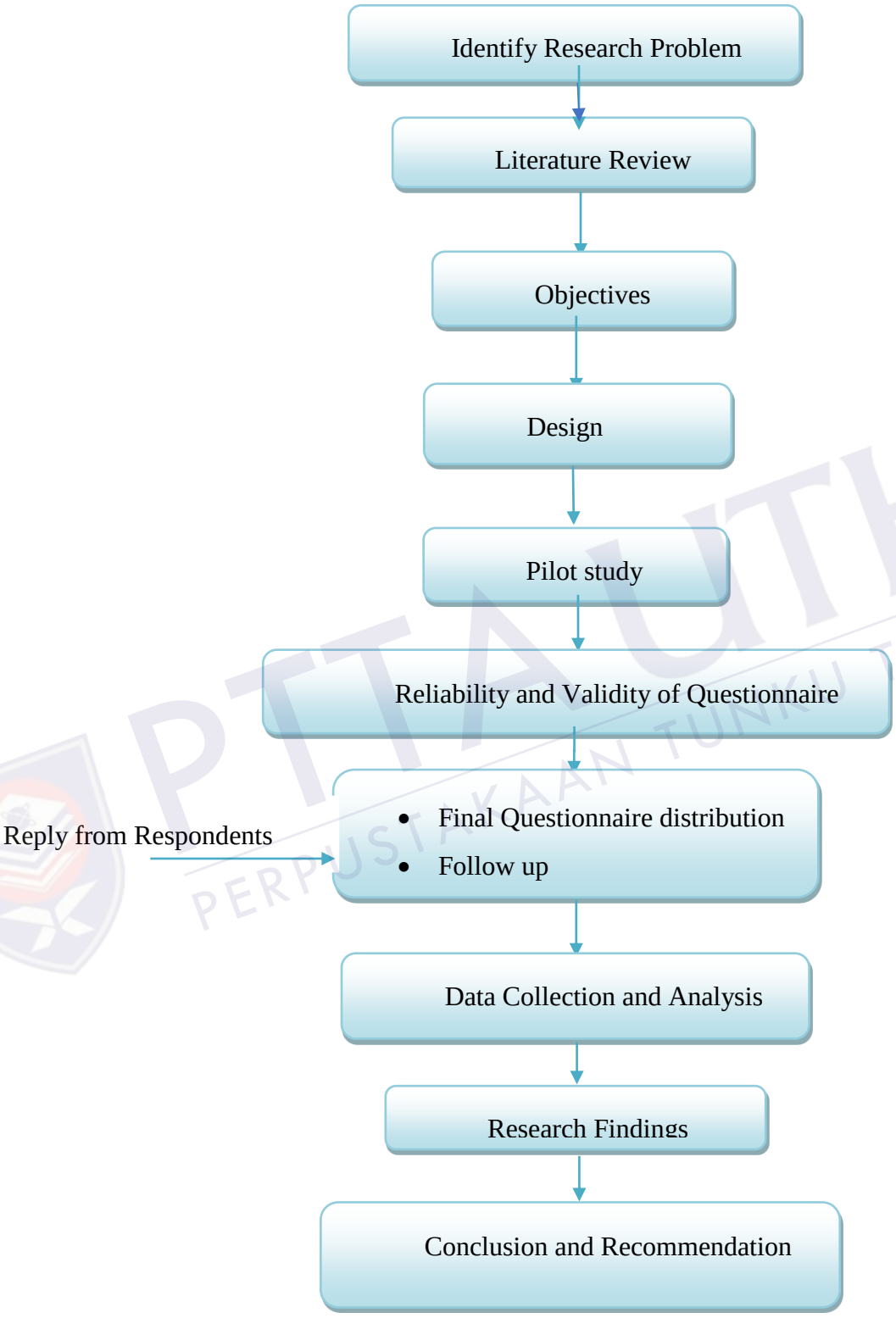

Figure 1. 1: Research process

1.9 Organization of Chapters

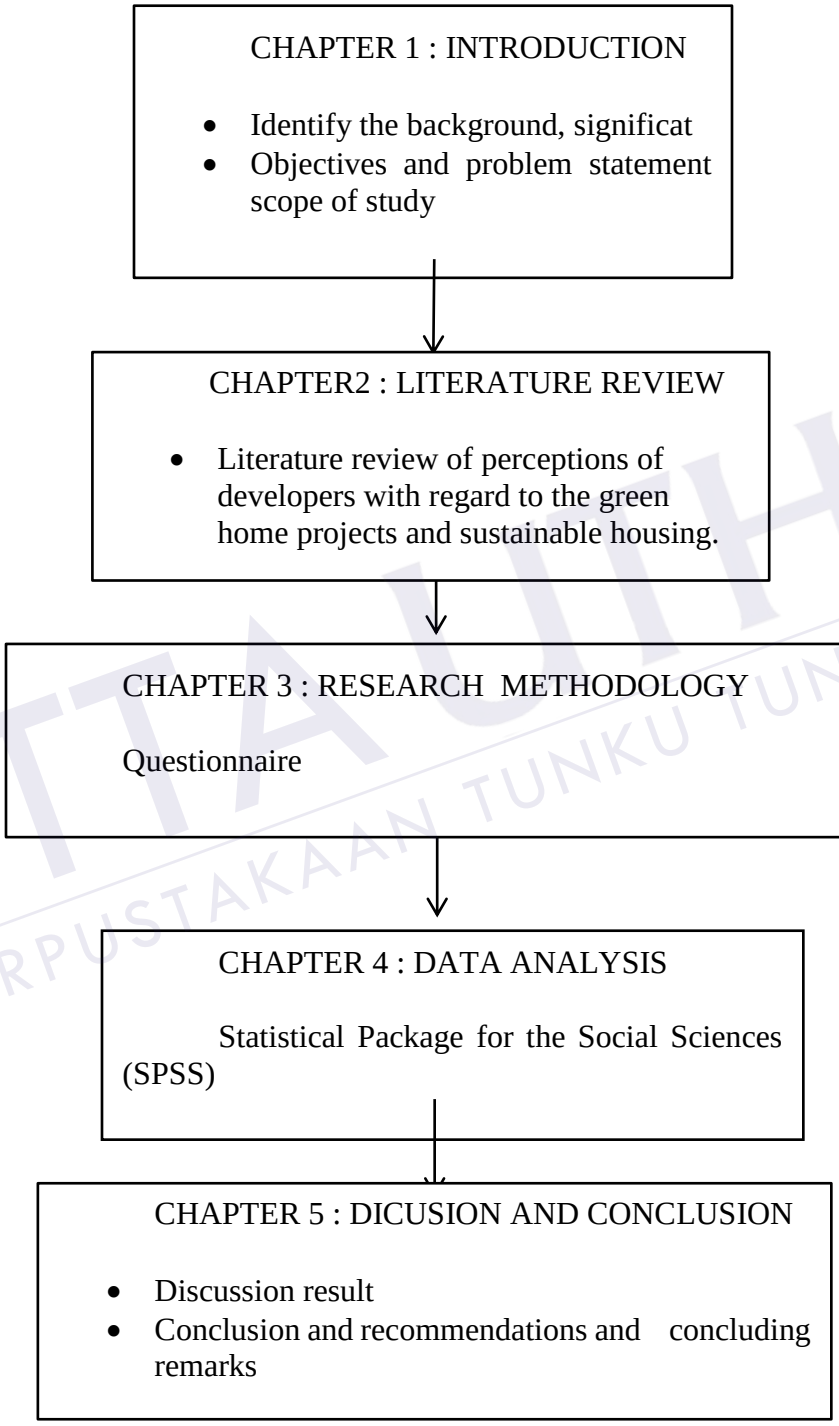

Figure 1. 2: Organisation of Chapters

The thesis consists of **FIVE (5)** chapters. The chapter's organisation are as follows:

I. Chapter 1: Introduction

This chapter consists of introduction to research, background of research, problem statement, research questions, research objectives, scope of research, significance of research.

II. Chapter 2: Literature Review

This chapter discuses on sustainable development housing including definition, perceptions of developers with regard to the green home project.

III. Chapter 3: Research Methodology

This chapter discusses on research approaches and strategies, and research procedures to be used as well as the process of both data collection and analysis of research were developed.

IV. Chapter 4: Data Analysis and Finding

This chapter explains data analysis from quantitative using questionnaire survey, and further discussion in detail of data analysis. Finally, findings are highlighted accordingly.

V. Chapter 5: Conclusion and Recommendations

The chapter presents conclusion and recommendations which were driven by the data analysis and discussion of the findings obtained. The chapter summarises the entire research work to be conducted where conclusion would be made. The recommendation is given based on the research subject matter for possible action to be taken. Moreover, it ends with highlighting the limitations in the research and conclusion remarks.

References

Ahna, Y. H. (2016). Integrated Construction Process for Green Building. *International Conference on Sustainable Design, Engineering and Construction* , 670 – 676.

Ali, Z. A. (2006). Achieving Sustainable Construction In The Developing Countries Of Southeast Asia . *Universiti Teknologi Malaysia,*, C30/C33.

Alias, A. (2010). The Green Home Concept – Acceptability And Development Problems. *Journal of Building Performance*, 2180-2106.

Elias, E. M. (2013). Green Residential Buildings: The Perspective of Potential Buyers. *Proceedings of 3rd Global Accounting, Finance and Economics Conference*, 978-1-922069-23-8.

Adler, R.W., " In Stumbling Toward Sustainability" ," Fresh water", (2002).

Andrew Grant. (2000). In Brian Edwards and David Turrent (Eds.), Sustainable Housing: Principles & Practice (pp. 44). London, New York: E & Fn Spon.

Baggott, S.L., Brown, L., Milne, R., Murrells, T.P., Passant, N., Thistlethwaite, D.G., 2005. Greenhouse gas inventories for England, Scotland, Wales and Northern Ireland: 1990–2003. AEA Technology PLC for DEFRA

Bhatti M, 2001, ``Housing/futures? The challenge from environmentalism" Housing Studies 16 39 -52.

Bluyssen PM (2009). Towards an integrative approach of improving indoor air quality. Building and Environment 44: 1980–1989.

Collier, C. "Save some for Tomorrow". Environmental News Service (ENS). (1999).

Davis, A (2001, November 1). Barriers to building green. Retrieved April 20, 2015.

E. Daniel. 2016. *The Usefulness of Qualitative and Quantitative Approaches and Methods*

in Researching Problem-Solving Ability in Science Education Curriculum. Journal of Education and Practice ISSN 2222-1735 (Paper) ISSN 2222-288X (Online) Vol.7,

Edwards B. and Turrent D. (2000). Sustainable Housing : Principles & Practice. London, New York: E & Fn Spon.

EPA (2016). US Environmental Protection Agency Definition of Green Building. Available: https://archive.epa.gov/greenbuilding/web/html/about.html

Fellows, M. (2011, July 14). What Is a Construction Developer? Retrieved from http://www.ehow.com/info_8736957_construction-developer.html

Flint, Warren, "The Sustainable Development of Water Resources" Water Resources Update, Issue 127, (2004).

Fellows, R. and Liu, A. (1997), *Research Methods for Construction*, Blackwell Science Limited, Oxford.

Häkkinen, T. (2011). Barriers and Drivers for Sustainable Building", . *Building Research and Information, Vol.39 (3),*.

Hatfield Dodds S, 2000, ``Pathways and paradigms for sustaining human communities",in Sustaining Human Settlement: A Challenge for the New Millennium Ed. R J Lawrence (The Urban International Press, North Shields) pp 28 -54.

Huovila, P., Ala-Juusela, M., Melchert, L., Pouffary, S., 2007. Buildings and climate change—status, challenges and opportunities. United Nations Environment Programme.

H. Waddel. (2008,). "Sustainable Construction and UK Legislation and Policy",Management, Procurement and Law, 161(MP3), . pp. 127 - 132.

Ibrahim, F. A. (2014). Green Homes Development: Factors Affecting Housing Developers' Readiness . *Journal Of Engineering And Applied Sciences* , Issn 1819-6608 .

Isa, N. K. (2014). A Review on Sustainability Principles of Building: Formulation of a Theoretical framework. *Journal of Surveying, Construction and Property (JSCP)*, Volume 5,.

Ismail, R., Mohd Shafiei, M., Said, I., & Ibrahim, F.(2013). Green Home Development Practices and House Buyers' Requirement.

Klufallah, M. M. (2014). Assessment of Carbon Emission Reduction for Buildings Projects in Malaysia-A Comparative Analysis. *Universiti Teknologi PETRONAS*, 10.1051.

Mohamed, S. (2015). A REVIEW OF SUSTAINABLE DEVELOPMENT FOR HOUSING SCHEME IN MALAYISA. *Global Journal of Engineering Science and Research Management*, 1/2.

Mohamed and Seow and Goh Kai Chen and Masrom, Mohd Asrul Nasid and Abd Rahim, (2014) The management of sustainable development at Malaysian local government: stakeholders' perception. In: IIES 2014, 1-4 December 2014, UTHM.

Mustafa M. A. (2014). Assessment of Carbon Emission Reduction for Buildings Projects in Malaysia-A Comparative Analysis. *published by EDP Sciences*.

Munksgaard, J., Pedersen, K.A., 2001. CO2 accounts for open economies: producer or consumer responsibility? Energy Policy 29 (4), 327–334

McDonough W. and Braungart M. (1998). *The Next Industrial Revolution*. Retrieved November 13, 2008, from the Atlantic.

Nazirah Zainul, A. (2013). Enablers and challenges of a sustainable housing industry in Malaysia. *Construction Innovation.*

Ott W, Steinemann A, Wallace L, eds. (2007). Exposure Analysis. Boca Raton, FL: CRC Press.

Priemus, H. (2005). How to make housing sustainable? The Dutch experience. Environment and Planning B: Planning and Design, 32(1), 5-19.

Pilkington, B., Roach, R., & Perkins, J. (2011). Relative benefits of technology and occupant behaviour in moving towards a more energy efficient, sustainable housing paradigm. Energy Policy, 39(9), 4962-4970.

Robichand, L. (2011,). Greening Project Management Practices for Sustainable Construction",. *Journal of Management in Engineering,*, pp. 48 - 57.

REHDA. About REHDA. Real Estate and Housing Developers' Association Malaysia 2000-2015.

SEZER, M. (2009). Housing As A Sustainable Architecture In Turkey: A Research On Toki Housing . *Middle East Technical University*, 1/5.

Sezer, M., Liszka, S. and Lodzinski, L. (2008). Sustainable Architecture: Passive Building Development. 8. Semester Architecture and Design Project Report. Aalborg: Aalborg University

Shafii, F. (2006). Achieving Sustainable Construction In The Developing Countries Of Southeast Asia. *Proceedings of the 6th Asia-Pacific Structural Engineering and Construction Conference*, 1/5.

Sezer, M. (2009). Housing as a sustainable architecture in Turkey: A research on toki housing," (Doctoral dissertation, Master Thesis, METU, Turkey).

Shorrock, L.D., Henderson, G., 1990. Energy Use in Buildings and Carbon Dioxide Emissions. Building Research Establishment, Report BR170.

Shorrock, L.D., Henderson, J., Utley, J.I., 2005. Reducing Carbon Emissions from the UK Housing Stock. Building Research Establishment, Report BR480.

Steinemann A, Walsh N (2007). Environmental Laws and Exposure Analysis. In Exposure Analysis, ed. Ott W, Steinemann A, Wallace L. Boca Raton, FL: CRC Press, pp. 487-513.

Sonagar, B. (2008,). Towards a Sustainable Construction Practices", Construction Information Quarterly,. pp.101 –108.

Tan, T.(2014). Assessing Grean Home Performance: A Case study of Iskandar Malaysia, 4(1).

Treloar. (2001). , "Building Materials Selection: Greenhouse Strategies for Built Facilities",. pp. 139 - 149.

Tan, T. H. (2013). Assessing Green Home Performance: The Case Study from a Developing Country. *Asia Pacific Network for Housing Research (APNHR) Conference*.

Vickers, A. "Clean Water Through Conservation" Water Use and Conservation, Amherst, MA Waterplow Press, (2002).

WHO (2010). World Health Organization. WHO Guidelines for Indoor Air Quality: Selected pollutants. Copenhagen, WHO Regional Office for Europe. Available.

Xia, C., Zhu, Y., & Lin, B. (2007). Renewable energy utilization evaluation method in green buildings. Renewable Energy, 883-886.

Yoong, C. B. (2014). Sustainability in the Construction Industry in Malaysia:The Challenges and Breakthroughs. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, Vol:8, No:4,.

yudelson, j. (2007). Green Building, A to Z. *New Society Publishers,*.

Zainul Abidin, N. Y. (2012). A Foresight into Green Housing Industry in Malaysia. World Academy of Science, Engineering and Technology International Journal of Mechanical and Industrial Engineering, No:7, 2012.